

ATTORNEY DOCKET NO. 00-C-015 (STMI01-00015)
U.S. SERIAL NO. 09/656,985
PATENT

1 1. (amended) A method of forming a linear photosensor array, comprising:

2 forming a plurality of integrated circuits each including a linear array of photosensors
3 within a portion of the integrated circuit remaining exposed after packaging and a plurality of
4 conductive leads adapted for soldering to a circuit board;

5 mounting the integrated circuits with the portions containing the photosensors in
6 alignment on a circuit board; and

7 soldering at least some of the leads for each integrated circuit to the circuit board.

8 2. (amended) The method of claim 1, wherein the step of forming a plurality of integrated
9 circuits each including a linear array of photosensors within a portion of the integrated circuit
10 remaining exposed after packaging and a plurality of conductive leads adapted for soldering to
11 a circuit board further comprises:

12 packaging each of the plurality of integrated circuit packages by:

13 affixing an integrated circuit die to a lead frame;

14 connecting the integrated circuit die to selected portions of the lead frame with
15 bond wires; and

16 encapsulating a portion of the lead frame and the integrated circuit die except for
17 the exposed region, wherein the exposed region of the integrated circuit die remains
18 exposed to external ambient light.

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1 3. (unchanged) The method of claim 2, wherein the step of encapsulating a portion of the lead
2 frame and the integrated circuit die except for the exposed region, wherein the exposed region
3 of the integrated circuit die remains exposed to external ambient light further comprises:

4 after affixing the integrated circuit die to the lead frame and connecting the bond wires,
5 mounting the lead frame with the integrated circuit die and bond wires in a mold with a portion
6 of the mold in contact with the exposed region of the integrated circuit die to prevent
7 encapsulating material from adhering to the exposed region of the integrated circuit die.

1 4. (unchanged) The method of claim 3, wherein the step of mounting the lead frame with the
2 integrated circuit die and bond wires in a mold with a portion of the mold in contact with the
3 exposed region of the integrated circuit die to prevent encapsulating material from adhering to
4 the exposed region of the integrated circuit die further comprises:

5 mounting the lead frame with the integrated circuit die and bond wires in a mold having
6 a sloped surface adjacent to the portion of the mold contacting the exposed region of the
7 integrated circuit die, wherein the sloped surface forms one surface of a mold cavity receiving
8 the bond wires when the lead frame with the integrated circuit die is mounted in the mold.

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1 5. (amended) The method of claim 1, wherein the step of forming a plurality of integrated
2 circuits each including a linear array of photosensors within a portion of the integrated circuit
3 remaining exposed after packaging and a plurality of conductive leads adapted for soldering to
4 a circuit board further comprises:

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5 mounting a plurality of integrated circuit die on a lead frame strip with a separation
6 between the mounted integrated circuit die approximately equal to a kerf width for a singulation
7 saw to be used in separating the packaged integrated circuits.

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1 6. (amended) The method of claim 1, wherein the step of mounting the integrated circuits with
2 the portions containing the photosensors in alignment on a circuit board further comprises:

3 packaging the integrated circuits with the portion containing the photosensors exposed;

4 and

5 mounting adjacent packaged integrated circuits in contact with each other.

1 7. (amended) The method of claim 1, wherein the step of soldering at least some of the leads
2 for each integrated circuit to the circuit board further comprises:

3 soldering only leads on one side of each integrated circuit to the circuit board, leaving

4 leads on an other side of the packaged integrated circuits in floating contact with conductive

5 structures on the circuit board to facilitate adjustment and removal of integrated circuits.

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- 1 8. (unchanged) An integrated circuit package for a linear photosensor array, comprising:
2 a lead frame including a die paddle and a plurality of leads;
3 an integrated circuit die affixed to the die paddle, the integrated circuit die including a
4 plurality of photosensitive devices linearly aligned along a length of an upper surface of the
5 integrated circuit die; and
6 packaging encapsulating a portion of the lead frame and the integrated circuit die except
7 for a region of the integrated circuit die containing the photosensitive devices, wherein the
8 region containing the photosensitive devices remains exposed through the packaging.
- 1 9. (unchanged) The integrated circuit package of claim 8, wherein the die paddle of the lead
2 frame is shorter than the integrated circuit die.
- 1 10. (unchanged) The integrated circuit package of claim 8, wherein the integrated circuit is
2 affixed to the lead frame with an adhesive.
- 1 11. (unchanged) The integrated circuit package of claim 8, wherein the packaging does not
2 cover ends of the integrated circuit die.

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1 12. (unchanged) The integrated circuit package of claim 8, further comprising:

2 bond wires connecting the integrated circuit die to selected portions of the lead frame,
3 wherein the packaging encapsulated the bond wires.

1 13. (unchanged) A linear photosensor array, comprising:

2 a circuit board; and

3 a plurality of packaged integrated circuits mounted on the circuit board, wherein each
4 packaged integrated circuit includes an array of photosensors linearly aligned along a length of
5 a surface region of an integrated circuit die therein and a plurality of conductive leads adapted
6 for soldering to the circuit board,

7 wherein the packaged integrated circuits are mounted in a line on the circuit board with
8 the surface regions of each packaged integrated circuit in alignment, and

9 wherein at least some of the leads for each packaged integrated circuit are soldered to
10 the circuit board.

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1 14. (unchanged) The linear photosensor array of claim 13, wherein the each of the integrated
2 circuit packages further comprises:

3 an integrated circuit die affixed to a lead frame;
4 bond wires connecting the integrated circuit die to selected portions of the lead frame;
5 and

6 packaging encapsulating a portion of the lead frame, the integrated circuit die except for
7 the surface region containing the array of photosensors and ends of the integrated circuit die,
8 and the bond wires,

9 wherein the surface region of the integrated circuit die containing the array of
10 photosensors remains exposed to ambient light.

1 15. (unchanged) The linear photosensor array of claim 13, wherein adjacent packaged
2 integrated circuits on the circuit board are mounted in contact with each other such that the array
3 of photosensors on each integrated circuit die form a single, long, continuous photosensor array.

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1 16. (unchanged) The linear photosensor array of claim 13, wherein only leads on one side of
2 each packaged integrated circuit mounted on the circuit board are soldered to the circuit board,
3 while leads on an other side of each packaged integrated circuit are left in floating contact with
4 conductive structures on the circuit board to facilitate adjustment and removal of packaged
5 integrated circuits.

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1 17. (unchanged) A mold for packaging integrated circuits, comprising:

2 a surface against which a lead frame strip may be placed, the surface including pins
3 projecting therefrom which are received by tooling holes within a lead frame strip placed
4 against the surface;

5 a plurality of cavity regions extending from the surface, each cavity region receiving an
6 integrated circuit die affixed to the lead frame strip and bond wires connecting the integrated
7 circuit die to the lead frame strip when the lead frame strip is placed against the surface, each
8 cavity region formed by:

9 a first surface contacting a surface region of the integrated circuit die when the
10 lead frame strip is placed against the surface and preventing encapsulate material from
11 adhering to the surface region of the integrated circuit die, and

12 a sloped surface extending from the first surface of the cavity to form an area
13 receiving the bond wires connecting the integrated circuit die to the lead frame strip
14 when the lead frame strip is placed against the surface.

1 18. (unchanged) The mold of claim 17, wherein the plurality of cavity regions are contiguous
2 and form a single cavity.